

CLAIMS

1. A manufacturing method of a magnetic head device, comprising:

a preheating step of irradiating a laser beam to terminal pads of a magnetic head slider and to connection pads of a lead conductor member that is to be electrically connected to the magnetic head slider;

a supply step of supplying conductive metal material for connecting said terminal pads and said connection pads during or after said preheating step; and

a heating step of performing molten-metal connections between said terminal pads and said connection pads by irradiating a laser beam to said conductive metal material.

2. The method as claimed in claim 1, wherein said preheating step comprises irradiating a laser beam with an irradiation energy controlled to secure wettability for connections of said conductive metal material.

3. The method as claimed in claim 1, wherein said preheating step comprises irradiating a laser beam with an irradiation energy controlled to stepwise change with the lapse of time, from a low level to a high level.

4. The method as claimed in claim 1, wherein said

preheating step comprises irradiating a laser beam with an irradiation energy controlled so that a temperature of a magnetic head element of said magnetic head slider becomes 150 °C or less.

5. The method as claimed in claim 1, wherein said supply step comprises disposing or injecting said conductive metal material so that the conductive metal material abuts on at least either said terminal pads or said connection pads.

6. The method as claimed in claim 1, wherein said supply step comprises supplying solder, solder with core inside, silver or gold.

7. The method as claimed in claim 1, wherein said preheating step comprises preheating dummy terminal pads formed on said magnetic head slider and dummy connection pads to be connected with said dummy terminal pads, wherein said supply step comprises supplying conductive metal material for connecting said dummy terminal pads and said dummy connection pads, and wherein said heating step comprises performing molten-metal connections between said dummy terminal pads and said dummy connection pads by irradiating a laser beam to said conductive metal material for connecting said dummy terminal pads and said dummy connection pads.

8. A manufacturing apparatus of a magnetic head device, comprising:

a preheating means for irradiating a laser beam to terminal pads of a magnetic head slider and to connection pads of a lead conductor member that is to be electrically connected to the magnetic head slider;

a supply means for supplying conductive metal material for connecting said terminal pads and said connection pads during or after said preheating step; and

a heating means for performing molten-metal connections between said terminal pads and said connection pads by irradiating a laser beam to said conductive metal material.

9. The apparatus as claimed in claim 8, wherein said preheating means comprises means for irradiating a laser beam with an irradiation energy controlled to secure wettability for connections of said conductive metal material.

10. The apparatus as claimed in claim 8, wherein said preheating means comprises means for irradiating a laser beam with an irradiation energy controlled to stepwise change with the lapse of time, from a low level to a high level.

11. The apparatus as claimed in claim 8, wherein said

preheating means comprises means for irradiating a laser beam with an irradiation energy controlled so that a temperature of a magnetic head element of said magnetic head slider becomes 150 °C or less.

12. The apparatus as claimed in claim 8, wherein said supply means comprises means for disposing or injecting said conductive metal material so that the conductive metal material abuts on at least either said terminal pads or said connection pads.

13. The apparatus as claimed in claim 8, wherein said supply means comprises means for supplying solder, solder with core inside, silver or gold.

14. The apparatus as claimed in claim 8, wherein said preheating means comprises means for preheating dummy terminal pads formed on said magnetic head slider and dummy connection pads to be connected with said dummy terminal pads, wherein said supply means comprises means for supplying conductive metal material for connecting said dummy terminal pads and said dummy connection pads, and wherein said heating means comprises means for performing molten-metal connections between said dummy terminal pads and said dummy connection pads by irradiating a laser beam to said conductive metal

material for connecting said dummy terminal pads and said dummy connection pads.

15. A magnetic head device comprising:

a magnetic head slider with at least one magnetic head element and terminal pads electrically connected to said at least one magnetic head element;

a suspension for supporting said magnetic head slider;

a lead conductor member fixed to said suspension and provided with connection pads electrically connected to said at least one magnetic head element;

at least one dummy terminal pad formed on said magnetic head slider;

at least one dummy connection pad formed on said suspension or on said lead conductor member; and

a connection means for connecting said at least one dummy terminal pad and said at least one dummy connection pad.

16. The magnetic head device as claimed in claim 15, wherein said connection means is molten-metal connection of a conductive metal material.

17. The magnetic head device as claimed in claim 15, wherein said connection means is a molten-solder connection.

18. The magnetic head device as claimed in claim 15,
wherein said at least one dummy terminal pad is formed on a
first surface of said magnetic head slider, said first surface
being opposite to a second surface on which said terminal pads
are formed.